Primary teachers' experience of a physical education professional development programme

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Professional development (PD) is essential for primary school teachers to meet the demands of the education system. Quality PD is aligned with classroom conditions, school contexts and teachers' daily experiences. The purpose of the study was to explore primary teachers' experiences of a 6-week physical education professional development programme (PE-PDP). A single school case study was employed (N = 28 teachers, N = 780 pupils) and all teachers and a sample of children participated in focus group interviews. Transcripts were categorised and themed using systematic content analysis. Results revealed that post the PE-PDP, teachers' PE content knowledge had expanded and this encouraged them to use existing classroom paedagogical strategies in the PE context. This developed their confidence in teaching PE and a greater understanding of the PE curriculum and its purpose.

Keywords: professional development; physical education; outdoor and adventure activities; teacher change; qualitative methods

Introduction

Education is constantly changing and schools need well-informed and highly motivated teachers (Darling-Hammond 2000; Raymond 1998). There is growing evidence for, and recognition of, the importance of professional development (PD) in equipping educators to meet the challenges faced in schools (Betchel and O'Sullivan 2006; Guskey 2003). Good teaching has a positive impact on how and what children learn, therefore, high-quality PD is a priority for teachers (Villegas-Reimers 2003). Effective PD should be 'workplace based' to avoid risk of decontextualisation (Fullan 2006), focused on the day-to-day realities of classrooms and involve collective participation (Desimone 2009; Penuel et al. 2007), sustainable (Armour et al. 2005) and grounded in a sound theoretical and philosophical base (Huberman and Guskey 1995).

Knight (2002) states 'continuing professional development is needed because initial teacher education cannot contain all of the prepositional knowledge that is needed and certainly not that procedural ''know how'' knowledge which grows in practice' (p. 230). This coupled with the fact that many primary school teachers have limited experience and training in physical education means that we must expect they will require help and support.

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Professional development in physical education is now seeing a shift in interest towards PD that is aligned with classroom conditions, school contexts and teachers' daily experiences (Armour and Duncombe 2004; Armour and Yelling 2004). PD focused in this way is more likely to help teachers connect the PD they receive to their teaching context (Betchel and O'Sullivan 2006). Armour and Yelling (2004) reported that teachers defined effective PD as practical, relevant and applicable; able to provide useable ideas; delivered by a good presenter who understands the real world of teaching; challenging and thought provoking; and offering time for reflection and collaboration. Critically examining the provision and effectiveness of PD is important to ensure the success of teachers' teaching and learning practises.

Irish primary school teachers admit deficiencies when it comes to teaching physical education. They blame lack of training, almost non-existent in-service training and lack of facilities as primary reasons for their lack of enthusiasm for the subject (Broderick and Shiel 2000; Deenihan 2005; Fahey, Delaney, and Gannon 2005). Additional barriers include the perceived low subject status, lack of financial resources, insufficient equipment and perceived low level of principal support (Hardman and Marshall 2005). The Council of Europe (1985) stressed the importance of the class teacher and in particular their competence and imagination to overcoming the provision of poor facilities whereas the provision of the best of facilities will not compensate for a poor teacher.

Social constructivism provides a useful and appropriate theoretical perspective within which to locate this research (Kirk and MacDonald 1998; Light 2008). The school, teachers and pupils that form the basis of the study are viewed as existing within society and situated in time and influenced by history and culture. Kirk and MacDonald (1998) concluded that 'learning is an active and creative process involving an individual's interaction with their physical environment and with other learners' (p. 377). As changes in teachers' content and paedagogical content knowledge were central to the programme of PD, change theory also informed the study (Desimone 2009; Fullan 2006; Wayne et al. 2008). In order to bring about change in practise, teachers need to be nudged and encouraged to change and this needs to be carried out in a supportive environment. While models of change refer to change in practise, beliefs and student learning (Desimone 2009) there is little consensus as to the order in which these changes occur or if order matters once a PD programme has been effective in achieving change. The extent to which these changes happen is not clear with Wayne et al. (2008) pointing to duration of the PD programme as a factor. The PD programme, in this study, was designed to change individual teachers within the school and simultaneously change the system (school context) within which they worked (Fullan 2006).

Based on an earlier, related study (Coulter and Woods 2007) which reported the physical education practises, perspectives and PD needs of the teachers in this study, a whole school physical education PD programme (PE-PDP) focusing on outdoor and adventure activities (O&AA) was designed. The teachers in the study school were just beginning to implement the Primary Physical Education Curriculum (Government of Ireland 1999). The findings of the earlier study (Coulter and Woods 2007) showed that although teachers had received two days of national in-service, two hours of which focused on O&AA, only one teacher had attempted to teach O&AA. The remaining strands were being taught to varying levels within the school and teachers requested PD in all strands, however, it was agreed to begin with

O&AA. The teachers noted they did not have the required O&AA content knowledge, which led to lack of programme planning, material and resource provision and lack of content paedagogical knowledge (Coulter and Woods 2007).

This study describes teachers' experiences of a PE-PDP designed to address their limited content, paedagogical and paedagogical content knowledge in O&AA and how the findings might further inform research on PD provision in primary physical education. The research questions addressed in this study are:

- What aspects of the PE-PDP supported or impeded the teaching of O&AA within the school?
- How did teachers' and children's practises and perspectives of O&AA and physical education change, if at all?
- Based on what was learned determine how the future design and delivery of PE-PDPs for primary teachers could be improved and developed.

The PE-PDP

The PE-PDP was designed for a 6-week unit of work in O&AA facilitated by a physical education expert (Maura Coulter). It involved designing resources and materials and distributing these to all teachers in advance of their teaching the unit. The resources were designed to make the process of teaching the lessons as easy as possible and the lessons were detailed in terms of content and paedagogical approaches to be used. The lessons included orienteering and related activities, outdoor challenges (adventure trails, co-operative activities and physical challenges), scavenger hunts, treasure hunts, walking activities and understanding and appreciating O&AA. Once the teachers had read the materials and understood what was required, they began to teach O&AA for the first time. During this time, the facilitator was available in the school to offer a continuum of support for all teachers. The support provided entailed the facilitator to remain in the school all day (5.5 hours), each week for 6 weeks. Each class teacher (N = 27) received personalised support on request during their scheduled hour-long physical education lesson. This ranged from low-level support, that is, answering any questions teachers had on the contents of a lesson prior to, during or post the teacher teaching the lesson, through to intense support where the researcher modelled the full lesson and the teacher observed, taking notes or assisting if they felt competent. This modelling provided concrete examples of how to deliver the lessons in the school context, with all its limitations and challenges. During meetings with the teachers both prior to, during and following the PE-PDP, the rationale for, and reasoning behind, the sequence and flow of the lessons were discussed, so that the teachers could use the resources more flexibly.

Participants

A case study methodology was employed, using a single, large, suburban mixed school. There were 28 class teachers involved, 79% female. The average age was 39 ± 13.95 (range 21–61; average teaching years 16 ± 13.88; range 1–37), with 42% teaching for 5 years or less. The school had 27 classes with approximately 29 children

in each class (N = 780, age range 4–13 years, mean age 8.9 years ± 2.01, 44% female). Forty children from first to sixth class participated in the focus groups and all the teachers participated in one of eight focus groups (Table 1). The children were chosen by the class teacher as random sampling may have turned up shy, inarticulate children or children whose first language was not English.

Data collection methods

Focus group interviews

Qualitative data were collected through two focus group semi-structured interviews with each of the groups, as outlined in Table 1, before and after the PE-PDP. Teacher focus groups took place during the 2-weeks before and after the PE-PDP, each lasting approximately an hour. Child focus groups took place, during the same period, during the school day and lasted between 30 and 40 minutes. The interview schedule for the teachers included semi-structured questions around their thoughts on the PE-PDP, knowledge, O&AA as part of physical education and reaction of children they were teaching. The interview schedule for the children included questions on their thoughts of the 'new programme', knowledge and O&AA as part of physical education. The purpose of these interviews was to establish what aspects of the PD programme supported or impeded the teaching of a quality programme of O&AA within the school and how the teachers' and children's practises and perspectives of O&AA and physical education changed, if at all, following the PD programme.

Researcher field notes

A digitally recorded, daily journal was kept throughout the process. While many of the observations, records of incidental conversations, thoughts and opinions were of the researcher's own interpretation, they proved to be a useful secondary source of data and were invaluable in supporting and explaining the primary data collected. The observations focused on the teachers' class management, organisation and teaching and the children's participation, activity, enjoyment and learning during the lessons informing the research questions.

Table 1. Teachers and children involved in the various focus groups.

	Children		Teachers	
Class	Male	Female	Male	Female
Junior infants	–	–		4
Senior infants	–	–		4
First	3	3		3
Second	4	4		4
Third	3	3	2	1
Fourth	3	3		3
Fifth	3	3	1	2
Sixth	4	4	2	2
Total	20	20	5	23

Data analysis

The process of qualitative data analysis began with the transcription and reading of the data generated. All transcripts were categorised and themes using systematic content analysis (Charmaz 2006) were generated. At each stage of coding any ideas, thoughts and literature relationships were logged as memos/annotations and assigned/linked to the relevant data. Each code/category/theme was then carefully defined and recorded. The themes were then tested against the data – ensuring all coding stood and that findings were reliable and robust.

A coding system was created to support references to the data as follows: Focus group interviews with teachers – FGT. When reference to a teacher from a particular class is provided in the text, a number or initial was added. Similar coding was applied to children, for example, FGC5 refers to a children's focus group interview with a fifth class group. Field notes will be represented by the letters FN.

Trustworthiness

One way of increasing trustworthiness is to utilise multiple methods of data collection. Looking at things from different viewpoints can corroborate findings (Tashakkori and Teddlie 2003). In this study focus group interviews with teachers and children and FNs consisting of observations and incidental conversations were the methods used. FNs provided another perspective to support findings from the interviews and finally member checks with teachers during discussions allowed generated themes to be supported or refuted. Lincoln and Guba (1985) suggest that prolonged engagement can maximise trustworthiness and the researcher was in the field 6 months when this phase of the study took place. Checks were used with teachers and children regularly throughout the interview process to ensure that the researcher's perceptions of the teachers' and children's responses or actions were as they intended.

Findings

The uniqueness of this study context is a critical factor and what works here may not work elsewhere. However, we can learn from this study and try to devise the 'optimal mix' for PD to suit the context in which future programmes might be delivered. We must also be aware that the optimal mix requires flexibility as change occurs, as what works today may be different to what works next month, even within the same school as was experienced in this study.

The following section presents and discusses the teachers' and children's experiences of the PE-PDP. The findings will be discussed under the themes; (1) PE-PDP: resources and materials and modelling, (2) knowledge, (3) Children and O&AA, (4) Physical Education – the bigger picture.

Physical education professional development programme

Resources and materials

Teachers were provided with lesson plans and all resources and equipment to support these lessons prior to the PE-PDP. All teachers reported that the resources provided

were invaluable in supporting and enabling their teaching; 'I thought they [schemes and lessons plans] were brilliant … and resources excellent, the maps and especially once the controls were outside everything was set up for us' (FGT3). As the teachers' O&AA content knowledge was limited prior to the PE-PDP (Coulter and Woods 2007), this lack of knowledge limited their ability to design their own lessons 'it just made it so easy, so easy it was all laid out and the resources as well' (FGT2). Resources for O&AA are more challenging to prepare than for other strands as initial preparation of materials and equipment can be lengthy (Hopper, Grey, and Maude 2000) and this was corroborated by the teachers:

> In preparing those and having everything laminated and having everything prepared … is very difficult in PE, having everything ready and getting new resources out … It is very labour intensive. (FGT6)

Although time-consuming and labour intensive, once resources were prepared, they could be used over again, creating sustainable and relatively low-cost resources that could be used by other teachers within the school.

However, the simple provision of externally generated resources did not convert into teachers understanding how to teach from these resources, nor how to constructively critique the resources – although some teachers were quick to point out activities which did not work or that they perceived the children did not enjoy, as did the children '… the compass … it was very boring … [it was] inactive' (FGC6). The danger here is in potentially controlling and deskilling the teacher through the use of pre-packaged resources as they divorce the conceptualisation of the resource from the delivery or execution, which may in turn reduce the teachers' ability to adapt resources to the needs of the learners (Apple 1982). This was evident with some teachers stating that they were not sure what the resources were for or how to access them 'I didn't know what half the resources were for until I had to do it myself so I think there was a certain element where I didn't go and kind of look and figure out what was what' (FGT4), but other teachers confidently were able to adapt activities to suit their needs '… trying to think of variations, now myself, that you could do. Even to use aerial photographs rather than maps … it has got me thinking definitely. So I am happy …' (FGT3). Thus, use of resources varied amongst teachers; some used them more constructively than others, and provision of resources alone is insufficient for change to occur.

Modelling

Constructivist theories of learning have provided evidence that learners are not passive slates on which information is written. Rather learners actively construct their understanding of the world by contrasting new information with their current knowledge (Driscoll 1994). Constructivist approaches to human learning have led to the development of a theory of cognitive apprenticeship (Collins, Brown, and Newman 1987). This theory holds that masters of a skill often fail to take into account the implicit processes involved in carrying out complex skills when teaching novices. To combat this tendency, cognitive apprenticeships '… are designed, among other things, to bring these tacit processes into the open, where students can observe, enact and practice them with the help from the teacher …' (Collins, Brown, and Newman 1987). By listening to the facilitator explain exactly what she is doing and

thinking as she models the skill, the apprentice (teacher) can identify relevant behaviours and develop a conceptual model of the component processes involved.

During the PE-PDP, each teacher (N =27) was provided with the support he/she requested. This included; 66 complete lessons modelled by the facilitator (Maura Coulter); 45 partial lessons modelled or team teaching occurred; 19 lessons explained to the teacher, prior to the lesson being taught by the class teacher. Modelling the lessons for the teachers worked on a number of levels. It produced practical experiences that teachers could see, copy, try out and alter in a safe environment. Teachers commented that having the opportunity to actually see another teacher in action, modelling the content and strategies for them was extremely helpful '. . . seeing someone doing it and you modelling it, you feel better, more confident . . .' (FGT2), underlining the value of providing opportunities for teachers to construct new knowledge for themselves '. . .I wouldn't be the best teacher of PE . . . .so it showed me – I feel I could do it by watching you' (FGTSI):

> I think you need to see it in action. Because when it is written down on paper . . . it is very hard to visualize it unless you have seen it done. And once you have seen it done you will remember it again you know. (FGT1)

Learning in context is one of the basic premises of change theory, pinpointed by Elmore (2004) where improvement in teaching is 'more of a function of learning to do the right things in the settings where you work' (p. 73). The production of a DVD or online vignettes of lessons were suggested as possible supports; 'might be no harm to video it, I'm thinking in terms of you know, you have your notes but how do you do that again and if it was on a video you could say oh that's the photo star' (FGT JI). However, a drawback may be that lessons modelled on many DVDs, are not contextualised. Previous experience by the facilitator with professionally produced DVD's and online videos is that the context can be artificial in an effort to ensure the 'production' is polished and teachers are still left to adapt and change to suit their contexts.

During the modelling of lessons by the researcher some teachers participated in activities with their class – particularly the orienteering activities. While engaging in these activities teachers learned the skills, rules and strategies associated with the activity (FN). Ward (2009) recommends that teachers role-play being children in both pre and in-service PD. Teachers, therefore, learnt the sequence of the activities from the perspective of the student as well as teacher. In contrast to one day workshops where invariably the teacher pretends to be the child, in this context the teacher had opportunity to discuss and reflect on the decisions and improvisations that the researcher made as the teacher, and also had opportunity to ask questions from a child's perspective. Allied with this the interviews also provided opportunities and time to have in depth discussion about content, and strategies for teaching and learning (FN). These opportunities, as espoused by O'Sullivan and Deglau (2006) and reported by the teachers, complemented the 'apprenticeship of observation' experience to provide a richer learning experience for the teacher.

O&AA knowledge

Studies have found that lack of physical education content knowledge among the primary school generalist teachers contributed to uncertainty about what they were

doing and low levels of confidence and teacher motivation to teach physical education (Morgan and Bourke 2007). Knowing that teachers' content knowledge of physical education was poor and for O&AA it was non-existent (Coulter and Woods 2007), the aim of the PE-PDP was to ensure mediation of quality subject content knowledge. While it is not conclusive on the optimal length of time for PD initiatives (Cordingley et al. 2005; Villegas-Reimers 2003), many researchers have suggested that a substantial number of years are required for real and lasting change to occur. However, in this study teachers began to demonstrate that they felt more competent in their knowledge of the strand following the 6-week PE-PDP:

> . . . I can see the map dimension to it, the reading dimension that I can see, the physical exertion dimension to it. But it is still enjoyable under whatever heading it doesn't matter, the children want to do more of it . . . (FGT3)

and would be confident in implementing the new strand the following academic year 'I think I would do a lot more of it next year and the kids really loved it . . .' (FGT2). As teachers were slowly coming to terms with the content knowledge for their own class group they began to ask questions about the content for other class groups. Teachers questioned the O&AA content other teachers were teaching, to ascertain whether they were all teaching the same thing – as happened with the school's games programme. This discussion showed how teachers were beginning to reflect on the content and the overall programme progression and not just their lessons. It also pointed to an emerging barrier – the PDP was potentially too context focused. If teachers had different classes the following year where O&AA content was very different they would require continuing support to add to their content knowledge as the fear would be that they would teach the same content to every class without consideration of continuity or progression of learning. Future, PE-PDPs would need to find the balance between contextualised and general support, in order for teachers at the very least to acknowledge how each class lesson content aligned with the full programme and curriculum content.

Although teachers were becoming familiar with O&AA, teachers identified that they would still require additional support 'the only person slowing them [the children] down is me . . .' (FGT 3). They also felt their capacity to explain clearly to children the tasks at hand needed further development. For example, this particular teacher did not feel competent in map reading so therefore felt even less competent trying to teach a child how to map read, 'I know orienteering . . . .and I am not great at anything like that' (FGT1). One teacher in particular stated that she required more 'practice, to be honest, I don't think I would be confident taking a class out yet' (FGT4). These comments show that PD needs to be sustained over a period of time to consolidate learning.

Shulman (1987) suggests that teachers need to reflect on their experiences in order to consolidate and understand new knowledge. In this study, the process of discussion which occurred during the interviews with teachers was identified as a chance to reflect and consolidate on the knowledge provided during the PE-PDP. Teachers commented that these were the first and only times they, as a group, discussed and questioned practise in physical education (FN). These discussions/interviews became pivotal in encouraging teachers to change their approach to teaching O&AA and ultimately to question their teaching of physical education. They provided an opportunity to

question, debate, share and reflect on how the PE-PDP was impacting on them as teachers and their pupils. According to Borko (2004) teachers welcome these discussions yet discussions which support critical examination of teaching are relatively rare. From interactions with teachers during the focus groups and informally during the unit of work, it could be seen that content knowledge was beginning to develop, but that it would take longer than a 6-week PDP to result in significant changes in teachers' knowledge and practise. It would also take more time and further PD to ensure the teachers had the knowledge to enable critical discussion around the role of this content in the physical education curriculum they wished to deliver, which is a feature of a professional learning community (Borko 2004).

Children and O&AA

Children identified that they liked to be with their friends when participating in paired or group activities in O&AA '. . . the key thing for them is pairing off with friends that's a big draw . . .' (FGT6). This change in the social dynamic of physical education lesson as the O&AA programme progressed was also noted by the teachers who indicated that 'It's involved kids who wouldn't be to the forefront of your class normally, it's given kids a bit of impetuous to become involved and enjoy it' (FGT6). Children who may have been on the periphery of groups during games were now coming into their own and others wanted to be in their groups, maybe because they now felt that this person had something to offer in the O&AA physical education lesson '. . . the kids really loved it and every single one of them was involved compared . . . if you were doing games on the pitch' (FGT2). Teachers felt that these children were now sought out for their intelligence, capacity for problem solving and common sense approach. Children who normally would not stand out in class were emerging as leaders:

> . . . they came round him they came into his group . . . and he just gets out there to make up the numbers and sometimes he doesn't want to [take part in PE]. (FGT6)

These findings were similar to those found by Dyson (1995) who investigated students' perceptions of their physical education classes (undertaking O&AA through Project Adventure), and reported that students claimed to have increased their enjoyment and learning and more importantly that they liked to challenge themselves in physical education. Children from all classes found that an aspect of O&AA which they enjoyed most was that they had to use their heads as well as their bodies:

> Its not really like football . . . because in football the good people dominate, you don't have to be that smart but you have to be smart to do orienteering and everything. (FGC5)

Both children and teachers commented that girls who would not normally take part in physical education were now taking part and for the duration of the PDP, not one child opted out (FN). Teachers commented that previously some girls liked to sit at the side and chat or 'do' each other's hair, and this did not occur during the PE-PDP (FN). In another study, Humberstone (1990) contended that in mixed sex classrooms girls are marginalised and their abilities under-rated. What is significant from her study is the contrast between 'traditional' physical education programmes that are mediated

through an ideology which supports masculine imagery and superiority and that evidenced in the adventure education programmes which facilitated behaviours which encouraged collaborative endeavours and non-competitive challenge.

Guskey (1986) argues that teachers care very much about their students, and are highly committed to learning and are reluctant to try new ideas and methods unless they are sure to work. He suggests therefore that a key feature for change is to build in early successes for the teachers where they can see a demonstrable positive effect on their students as a result of the changes made to practise. During the PE-PDP teachers noticed a change in school environment and in the children:

> I noticed there was always a buzz around the place . . . I don't know when I have seen that excitement before and they were really utterly oblivious of me. I was standing right beside them and I might as well have not been there whatever that was I want more of that, to do that! (FGT3)

This Guskey says, will help teachers stay the course and commit to change. At this stage of the PDP, change in student learning was beginning to elicit change in teachers' beliefs which would encourage change in teacher practise.

Physical education – the bigger picture

Teachers were beginning to see that physical education was more than physical activity as they had reported in an earlier related study (Coulter and Woods 2007) and admitted that following the PE-PDP their earlier idea of physical education was all wrong. They stated that the children too might not have understood that O&AA was physical education as it was so far removed from what they were used to:

> . . . I would say that they weren't as conscious that it was PE . . . so you had to explain that it was physical education. I suppose we have to be aware that their notion of PE is very confined too. (FGT2)

The teachers' and children's past experiences of physical education were very strong, and for some difficult to change. This was evident when 'you could have too much of the same thing . . . and you would have to mingle them [the lessons] every week every so often' (FGT6), 'loads of people in my class that like soccer were complaining that we should get soccer once in a while' (FGC6).

Teachers did, however, allude to the fact that the conversations/interviews both formal and informal were the starting point for them, in coming to understand physical education and teachers need to talk more to each other and the children about physical education:

> . . . I find this helpful, because I am saying things right here . . . Until I see it I can't say it, so conversation is the medium. I think it is the missing medium of PE. PE is just get out there, go out there and do it. Teachers never talk about it [PE] . . . (FGT3)

Discussion

This study took a different approach to PD and one not yet tried in Ireland; a sustained, contextualised, whole school approach. Much has been written

internationally on PD and effective PD in the area of physical education (Armour and Duncombe 2004; Armour and Yelling 2004; Betchel and O' Sullivan 2006; Desimone 2009; Penuel et al. 2007; Villegas-Reimers 2003). This study sought to bring the lessons learned from the research to an Irish context by working closely with a school community over time to build their knowledge and expertise in physical education and more specifically in O&AA.

This research demonstrated that these primary school teachers and their pupils gained benefits from the PE-PDP provided and allowed for knowledge development in O&AA and physical education as a whole. Our findings suggest that change in teaching can occur if teachers experience high-quality, sustained PD and observe positive change in student learning from their efforts. The PE-PDP provided was the first stage in the process of becoming a 'master teacher of physical education'. Further research will be carried out to investigate how these teachers progress and continue to move from 'apprentice' to 'master'.

The resources gave the teachers a starting point and compensated for what they perceived as a lack of curriculum knowledge. Although the curriculum knowledge provided was limited it developed teachers' confidence and knowledge. They also provided teachers with an idea of what a physical education lesson should look like and what constitutes the O&AA strand of the primary school curriculum. The resources overcame the barriers of high workload and lack of knowledge as to what resources to design or produce and have the potential to enhance teaching and learning in physical education.

The study showed that a successful PE-PDP involves learning through collective participation, and this is an on-going process and requires sustainability. As teachers' content knowledge increased so too did their paedagogical content knowledge skills. The contextualised and personalised nature of the teachers' learning supported Cochran et al. (1993) who state that paedagogical content knowing is best learned while working directly with pupils in the classroom because 'live teaching permits the direct interaction that shows ideas in use and opens the way to negotiating paths of understanding' (p. 267).

Professional development programmes in physical education should include time for discussion around physical education, and teachers should understand what physical education is and how to best facilitate it in their school. In other words an ethos of valuing physical education needs to exist as a foundation on which teachers can build so that PE-PD can thrive and quality physical education programmes ensure quality teaching and learning. Achieving change in school culture is extremely difficult (Grimmett and Crehan 1992), and is only by being onsite and experiencing this culture that a PE-PDP facilitator can come to understand the culture and suggest ways and means of eliciting change.

The ultimate aim of any PD programme should be to improve student learning. Measurement of children's learning was not quantified as part of the study, as 'it is foolhardy to either expect or focus on measuring student learning when teachers have just begun to learn and experiment with new ideas and strategies' (Loucks-Horsley et al. 1998, p. 222). However, there was perceived evidence of learning through the children's interviews. Children commented on the aspects of O&AA which they had learned, and also used the term 'learning' when describing their physical education experiences in the interviews, something which they had not alluded to prior to the PE-PDP. There was also evidence that children's engagement in physical education

lessons had increased greatly, during the PE-PDP, especially amongst girls. This perception of learning and inclusiveness of the O&AA unit signalled that teaching was effective. This was a critical first step in the teachers' change in practise.

Further support was identified if the programme, or the teaching context, was to change or develop beyond that facilitated. This supports the findings of Armour and Duncombe (2004) and O'Sullivan and Deglau (2006) where effective PD requires on-going support to extend practise.

Conclusion

In Ireland, many current primary school teachers have experienced a lack of appropriate physical education PD throughout the education learning continuum. This lack of exposure to and lack of PD in physical education led to a 'games' driven physical education programme within the study school. Hence, the PE-PDP focused its attention on one strand – O&AA – rather than the whole physical education curriculum. This focus on depth, rather than breath, gave teachers the time to cover content, paedagogical content and to understand and apply what they were learning during the PE-PDP. In future, PE-PDPs must consider the school context, understand what teachers have been exposed to previously, know what their current practises are, and from this knowledge develop a realistic programme.

While we acknowledge that the cost of such PD is likely to be expensive, the findings in this study support the idea that Department of Education and Skills and schools may have to focus PD on fewer teachers in order to provide the type of high-quality activities that are effective in changing practise. Within the current economic climate there are aspects of this PD programme which could be facilitated nationally on a reduced budget, such as provision of resources adaptable to school contexts. Some of the learning experiences of these teachers could be facilitated through contextualised workshops, such as examining resources, experiencing activities and learning how to organise the activities. However, this may not completely solve the problem, as was also noted in this study, since participation in PD programmes and activities remains primarily the decision of the individual teachers.

This study can inform and contribute to the growing body of research on PD for primary teachers in physical education. As the child is central to all teaching and learning it is imperative that the following recommendations be addressed by all those concerned with the promotion of physical education at all levels, both educational and political.

- The importance of quality physical education provision must be promoted and teachers encouraged to view their own PD as a means to achieving quality physical education for the children they teach.
- PE-PD should be contextualised and take place in school contexts with children present.
- PE-PD should be individualised to each learner's needs and engage learners with the key skills and processes, ways of thinking and practicing relative to the content being mediated.
- PE-PD should focus on depth of content and paedagogical content knowledge rather than breadth.

- PE-PDPs should consider the provision of appropriate resources that support teacher learning and enhance content knowledge.
- PE-PDPs should encourage and facilitate opportunities for teachers to get together during the school day to prompt communication and collaboration and to foster a community of learning.

Professional development opportunities must be foremost in policy-makers' minds in ensuring that children's learning experiences are addressed at every decision-making level so that they may become a reality.

Notes on contributors

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